



The D-fenceline™ System

Advanced, High Technology
Real Time Fenceline Air Monitoring System



About Atmosfir

Atmosfir is an innovative, advanced air monitoring technology company focused on providing clients with the best air monitoring solutions. Atmosfir is a technology-oriented company, with unique and valuable intellectual properties and years of in-the-field experience. Our leadership team includes some of the world's most recognized and respected air measurement scientists. For over fifteen years, our experts have been actively involved in the development of US EPA test methods and have been involved in designing and implementing wide range of Optical Remote Sensing measurement projects.

Atmosfir Optics Ltd. provides a complete, fully automated, and reliable fence-line monitoring system. Atmosfir's data analysis and management algorithms yield the world's most versatile, sensitive, and cost-effective fence-line technology: The D-fenceline™ monitoring and air quality management system.



The D-fenceline™ System

The D-fenceline™ system based on ORS FTIR is the best available technology (BAT) for air monitoring of fugitive emissions. It is the recent, high technology, advanced optical remote sensing solution which has been developed to meet and accommodate the challenges of measuring, controlling and preventing air contaminants.

The revolutionary technology is installed along the fenceline and is designed with a patented algorithm to calculate measured concentration and meteorological data in order to draw a clear picture of the pollutant magnitude and its origin. Dozens of compounds can be detected simultaneously, quantified and located by the system in an unprecedented detection limit with a backup of an automated real-time alerting mechanism, spectral validation and spatial analysis. Controlled through a secured and friendly user interface.



The D-fenceline™ System Superiorities

-  Spatial Continuous Fenceline Monitoring
-  End to End Solution
DBOO – Design/Build/Own/Operate Business Model
-  Real Time Monitoring 24/7/365
-  Online Friendly High-End Secured User Interface
-  Contamination Source Location
-  Emission Flux Analysis
-  Unprecedented Detection Limit
-  Built-in Quality Assurance measures including a display of Spectral Validation
-  Data Averaging by using versatile Time Resolution
-  Wide range of Optical Remote Sensing Instruments - FTIR, TDL, UV-DOAS
-  Versatile Crossed Section Reporting Tool – Charts, Tables, Pollutant Roses
-  Advanced Alerting Mechanism

The Necessity of the D-fenceline Solution

Protecting the Environment

Contributing to Health and Safety

Staying in Compliance

Improving the Public Relation

The D-fenceline Clients

Petrochemical & Refinery

Chemical plants – fertilizers, plastic, acid, semiconductor, pharmaceutical, hazardous material holders

Land fields

Water treatment plant

Chemical terminals

Evaporation Pools

Government environmental ministries/agencies

Environmental organizations

Local authorities deal with environmental issues.

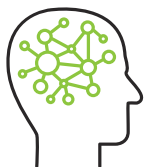
Environmental consulting firms

The Significant Achievements of the D-fenceline™

The D-fenceline™ system accommodates these four key elements of fenceline monitoring:



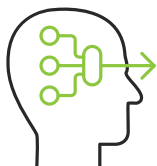
When Detection and alert in real time due to effective plume capture and short time resolution.



What Simultaneous detection and identification of dozens of emitted materials with absolute certainty, simplified by using proprietary a spectral validation feature FT-IR technology with Atmosfir's spectral analysis algorithm.



Where Combining continuous open path monitoring data with updated meteorological data allows for rapid determination of where the emissions are originating. The spatial feature of D-fenceline™ delivers critical information to evaluate the source of emissions.



How much Calculation of the ORS measurement data combined with the meteorological data by patented algorithms yields emission rate that could be correlated to an emission flux rate due to a momentary event and to measure an annual emission rate.

Recent Regulatory

Recent regulatory developments in the US and world-wide, have identified and required open path fence-line monitoring as a critical building block of air monitoring around chemical & petrochemical facilities.

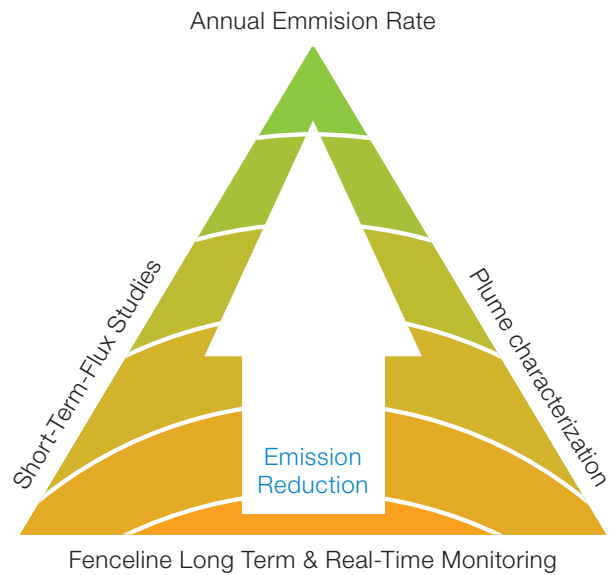
These new regulations differentiate between community monitoring and fenceline monitoring.

While conventional “point” measurement methods are standard for communities surrounding the potential chemical source, open path technologies are demanded at the fenceline of industrial sites to yield a more complete picture of facility emissions.

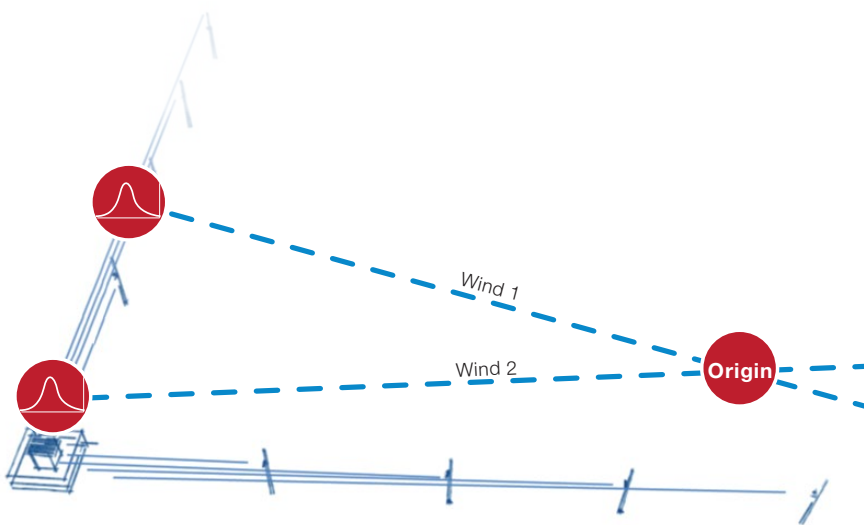
The True Way to Emission Reduction by The D-fencline™

The D-fencline™ implements the EPA model for reducing annual emission rate. By providing long term observation and real-time fence-line monitoring, short-term-flux studies and plume characterization a truly sustainable reduction of emissions and accurate estimate of an annual emission rates would be yielded.

*According to EPA guidance GD52

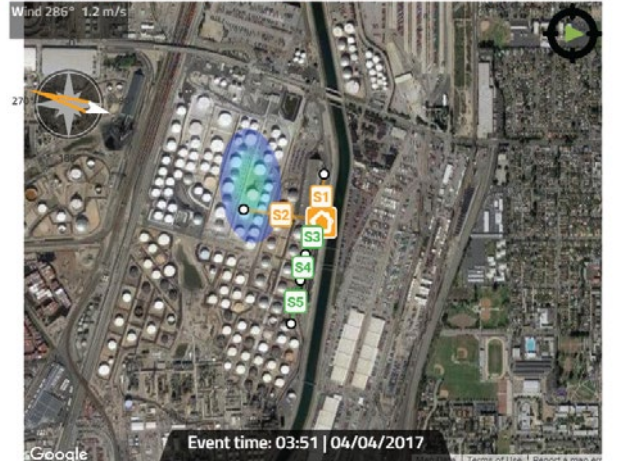


The Source Location Unique Algorithm



Product name:	Compound name:	Start time:	End time:		
Emission Data	TotalAlkanes	04/04/2017, 03:22:59	04/04/2017, 04:08:26		
S1 [ppb]	S2 [ppb]	S3 [ppb]	S4 [ppb]	S5 [ppb]	AL [ppb]
613.1	990.5	325.6	BQL	11.2	500.0

Wind 286° 1.2 m/s



Event time: 03:51 | 04/04/2017

The D-fencline™ presents a unique source location feature. Leaks can be precisely located using the fully automated D-fencline™ monitoring solution from Atmosfir. The Open Path FT-IR spectrometer mounted on a pan-and-tilt head records spectral information of various compounds in parallel along two directions, each separated in individual sections. Identification of the compounds for each measurement column is realized in real-time. With detailed consideration of wind speed and direction, the sources of the identified compounds are derived.

The results presented to the operator are visualized showing an overlay of the chemical and topological site information.

Tailored Solution

The flexibility of the D-fenceline™ platform allows for the development of monitoring tools that are tailored to the specifications of each client. Each situation may merit a different list of compounds that are essential for the client to monitor, different action levels and thresholds and different time intervals of monitoring reports. The experience and advanced vision of the Atmosfir team delivers the most versatile and complete solution available on the market.

Financial Benefits - Cost Effective Solution

The D-fenceline™ air monitoring system deployment results in reduced facility downtime and emphasizes the safety of employees and the neighboring community. Efficiently locating emissions allows producers to reduce environmental impact. Securing routine and continuous production translates to a more efficient and profitable operation.

The resulting financial benefits for a properly monitored facility include:

- Minimizing process down time
- Avoiding Regulatory Penalties
- Material loss prevention
- Reduced insurance costs

D-fenceline Atmospheric Analysis Components

The D-fenceline system has 3 different atmospheric analysis components.

Per customer predefined requests each component includes list of compounds with different attributes and presents alerts and emissions.



Air quality



Odor



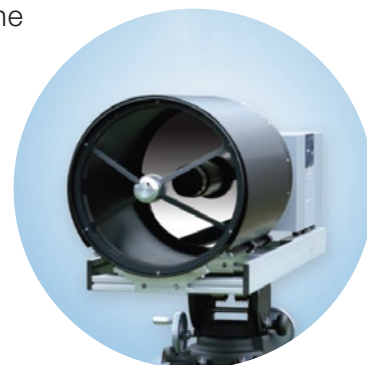
Emergency

The D-fenceline Hardware Components

The D-fenceline system is built with several components: OPS, Pan & Tilt scanner, retro reflectors and meteorological unit which are the best in the market, provided by the most reliable manufacturers.

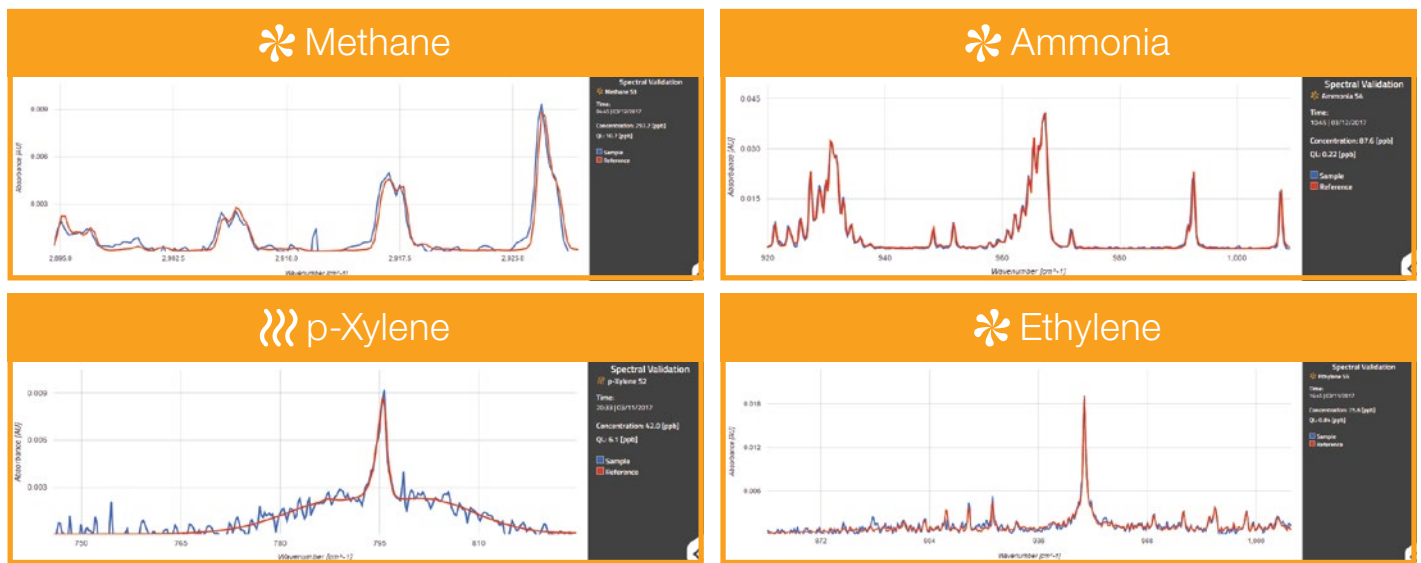
In combination with the most advanced, patented and sophisticated data evaluation in the environmental market, the performance results in unmatched sensitivity and accuracy.

The Bruker FT-IR open path spectrometer OPS is a compact, versatile, and rugged air monitoring system, designed to detect and simultaneously measure a wide range of compounds.



Spectral Validation

Built-in Quality Assurance measures including a display of Spectral Validation.

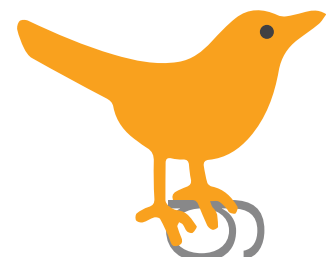


Unprecedented Sensitivity of the D-fenline

Typical System's Sensitivity (200 - 400 meters Pathlength)

Compound	Quantification Limit [ppb]		Compound	Quantification Limit [ppb]	
	(5 min average)	(1 hour average)		(5 min average)	(1 hour average)
Acetone	3	1	Hydrogen Bromide	3	1
Acrylonitrile	2	0.7	Hydrogen Chloride	1.5	0.5
Ammonia	0.5	0.2	Hydrogen fluoride	1.5	0.5
Benzene	3	0.5*	Methane**	5	2
Bromoform	9	3	Methanol	2	0.5
Butadiene	1	0.3	Methyl Amine	9	3
Carbon Disulfide	15	5	Methylene Chloride	1	0.3
Carbon Tetrachloride	0.5	0.2	m-Xylene	3	1
Chloroform	6	2	Nitrogen Dioxide	5	2
Dibromomethane	3	1	o-Xylene	3	1
Dichloromethane	6	2	Propylene	1	0.3
Dichloropropane	3	1	p-Xylene	3	1
Diethyl Amine	3	1	Sulfur Dioxide	5	2
Dimethyl Amine	3	1	Toluene	5	2
Ethylbenzene	20	7	Total-Alkanes	2	0.7
Ethylene	1	0.3	Triethylamine	3	1
Formaldehyde	1	3	Vinyl Chloride	1	0.3

* Single Path Data collection
** Above atmospheric background



Advanced Air Monitoring

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